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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,236	11/03/2003	Young Wuk Kwon		3762
7590	11/02/2004		EXAMINER	
Young Wuk Kwon Apartment A 3008 West Sunset Drive Carbondale, IL 62901			ELLINGTON, ALANDRA	
			ART UNIT	PAPER NUMBER
			2855	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/700,236	KWON, YOUNG WUK <i>pw</i>	
	Examiner	Art Unit	
	Alandra Ellington	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-19 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) 9-16 is/are allowed.
 6) Claim(s) 1-4,7,8 and 17-19 is/are rejected.
 7) Claim(s) 5 and 6 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 03 November 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/3/03</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the *rectangular cut-out portions having rounded corners described by ninety degree arcs joining any two adjacent sides to ligaments of equal length and width* (claim 3) and *ligaments having at least two centrally aligned adjoining rectangles of different surface area, the centrally aligned adjoining rectangles having rounded corners described by ninety degree arcs joining any two adjacent sides and positioned so that the centrally aligned adjoining become progressively smaller in surface area* (claim 5) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of

the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 5 and 6 are objected to because of the following informalities:

a. With respect to Claim 5:

- 1) Replace "centally" with – centrally – (line 3).
- 2) Replace "prgressively" with – progressively – (line 6).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by

Creager (5,425,274).

a. With respect to Claim 1, Creager discloses an apparatus for measuring the fatigue life of a structural member of known composition, said apparatus comprising a flat test-coupon 1,2 uniformly cast and composed of any material mountable on said structural member (col. 3 lines 37-40), said test-coupon 1,2 having at least two cut-out portions 5a-7a of different area which define at least

two parallel ligaments 5-7 of different lengths (col. 3 lines 40-47 {Fig. 1}), and said ligaments 5-7 having a shape so as to effect failure due to fatigue of said ligaments 5-7 at lower percentages of fatigue life of said structural member and prior to failure of said structural member due to fatigue when said ligament 5-7 and said structural member are subjected to substantially similar stress conditions and history (col. 3 lines 48-53).

b. With respect to Claim 7, Creager discloses the apparatus according to Claim 1 wherein said test-coupon 31,32 has at least two cut out portions 36a-39a of equal cross-sectional area and which define at least two ligaments 36-39 of the same length and the same shape with different elastic moduli (col. 4 lines 6-8,45-68, col. 5 lines 1-39 {Fig. 3}).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Creager (5,425,274) in view of Perez (5,528,151).

a. With respect to Claims 2, 4 and 8, Creager discloses the claimed invention except for the test coupon and structural member being composed of different materials. Perez teaches a test coupon 12 composed of a material other than

that composing a structural member 14 (col. 2 lines 40-49). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Creager with the teachings of Perez to include a test coupon composed of a material other than that composing a structural member for the purpose of creating fatigue stresses and predicting fatigue failure due to thermal cycling (see Perez, col. 1 lines 8-12,27-40).

b. With respect to Claim 3, Perez teaches rectangular cut-out portions having rounded corners described by ninety degree arcs joining any two adjacent sides such that the ligaments are all of equal length and width (col. 2 lines 57-67, col. 3 lines 1-15 {Figs. 1 and 2}).

8. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Creager (5,425,274) in view of Crites (3,786,679).

a. With respect to Claim 17, Creager discloses the method steps of providing a test-coupon 1,2 having known fatigue characteristics and configured so as to experience material failure due to fatigue prior to said structural member (col. 3 lines 48-57), subjecting said test-coupon 1,2 to repetitive stress loading so that said test-coupon 1,2 (col. 3 lines 48-57), and said structural member have a substantially similar stress history and rigidly attaching said test-coupon 1,2 upon said structural member so that said test-coupon 1,2 experiences the same stress loading as said structural member (col. 3 lines 58-63, col. 4 lines 1-8). However, Creager does not teach the method steps of subjecting said test-coupon and said structural member to repetitive stress loading of a constant displacement,

monitoring said test-coupon to determine how many loading cycles are necessary to cause failure in each of said ligaments, and using number of loading cycles necessary to cause failure in each of said ligaments for fatigue strength of each of said ligaments and to predict remaining useful service life of said structural member on the basis of an S-N curve depicting stress loading characteristics of material from which said structural member is composed.

Crites teaches the method steps of subjecting said test-coupon 11 and said structural member 61 to repetitive stress loading of a constant displacement (col. 4 lines 60-68, col. 5 lines 1-3 {Fig. 4}), monitoring said test-coupon 11 to determine how many loading cycles are necessary to cause failure in each of said ligaments 12-17 (col. 5 lines 1-19 {Fig. 4}), and using number of loading cycles necessary to cause failure in each of said ligaments 12-17 for fatigue strength of each of said ligaments 12-17 and to predict remaining useful service life of said structural member 61 on the basis of an S-N curve ({Fig. 4}) depicting stress loading characteristics of material from which said structural member 61 is composed (col. 5 lines 1-19 {Fig. 4}).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Creager with the teachings of Crites to include the method steps of subjecting said test-coupon and said structural member to repetitive stress loading of a constant displacement, monitoring said test-coupon to determine how many loading cycles are necessary to cause failure in each of said ligaments, and using number of loading cycles necessary to cause failure in

each of said ligaments for fatigue strength of each of said ligaments and to predict remaining useful service life of said structural member on the basis of an S-N curve depicting stress loading characteristics of material from which said structural member is composed for the purpose of predicting fatigue failures in structural members under limited and specific conditions (see Crites, col. 1 lines 5-9, col. 5 lines 1-19 {Fig. 4}).

b. With respect to Claim 18, Crites teaches a test coupon 11 is composed of a material other than that composing said structural member 61 (col. 3 lines 32-33).

c. With respect to Claim 19, Creager discloses the method step of making a flat test-coupon 1,2 uniformly cast of material identical to that comprising said structural member (col. 3 lines 37-40), said test-coupon 1,2 having at least two cut-out portions 5a-7a of different area which define at least two parallel ligaments 5-7 of different lengths (col. 3 lines 40-47 {Fig. 1}). Crites teaches the method steps of subjecting said test-coupon 11 to repetitive loading of a constant displacement until all of said ligaments 12-17 in said test-coupon 11 fail (col. 4 lines 60-68, col. 5 lines 1-3 {Fig. 4}), monitoring said test-coupon 11 to determine how many loading cycles are necessary to cause failure in each of said ligaments 12-17 (col. 5 lines 1-19 {Fig. 4}), and using number of loading cycles necessary to cause failure in each of said ligaments 12-17 to compute fatigue strength of each of said ligaments 12-17 at a given displacement (col. 5 lines 1-19 {Fig. 4}).

Allowable Subject Matter

9. Claims 9-16 are allowed.
10. The following is an examiner's statement of reasons for allowance: The reason for allowance are based on the inclusion of *groupings arranged such that parallel ligaments in any grouping will not be parallel to parallel ligaments in any other grouping in test-coupon.*
11. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

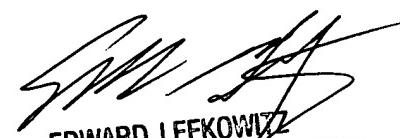
12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. Duerr (6,578,430) discloses a service life indicator for highly stressed structures.
 - b. Brull (4,590,804) discloses a device for monitoring fatigue life.
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alandra Ellington whose telephone number is (571) 272-2178. The examiner can normally be reached on Monday - Friday, 7:30am - 4:00pm.
14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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